

153. (New) A multi-chamber system according to claim 147 wherein said means for introducing said oxidizing gas is a gas intake valve.--

REMARKS

Applicant would like to thank the Examiner for the consideration given the present application. The Examiner's Office Action of **November 7, 2001** has been received and its contents carefully noted. Applicant respectfully submits that this response is timely filed and fully responsive to the Office Action.

Claims 80-82, 84-88, 92-94, 98-100, 105, 108-110, 114, 115, 118-120 and 132-135 were pending in the present application prior to the aforementioned amendment, with claims 84 and 85 being withdrawn from consideration by the Examiner. By the above amendments, claims 80, 86, 92 and 98 are amended and new claims 136-153 are added to recite additional protection to which Applicant is already. Applicant respectfully submits that no issue of new matter is set forth by the above amendments. Accordingly, claims 80-82, 84-88, 92-94, 98-100, 105, 108-110, 114, 115, 118-120 and 132-153 are now pending herein, and, for the reasons set forth in detail below, are believed to be in condition for allowance.

A. 35 U.S.C. §102 Rejection

Initially, the Examiner rejects claims 80, 81, 86, 87, 104, 105, 108 and 109 under 35 U.S.C. §102(e) as clearly anticipated by U.S. Patent No. 5,352,291 to **Zhang et al.** (Hereinafter "**Zhang**"). Applicant respectfully submits that rejected claims as presently amended define subject matter that is clearly patentably distinct from the **Zhang** patent.

As presently amended, base claims 80 and 86 are directed to a multi-chamber system including, *inter alia*, a first chamber for irradiating a laser light to a semiconductor film formed over a substrate and a means for introducing an oxidizing atmosphere into the first

chamber. Such a feature is supported at least FIG. 1 (at reference numeral 18).

Applicant respectfully contends that the **Zhang** patent fails to expressly teach or inherently disclose a multi-chamber system comprising a means for introducing an oxidizing atmosphere into a first chamber for irradiating a laser light to a semiconductor film formed over a substrate. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection.

B. 35 U.S.C. §103 Rejection

The Examiner further rejects claims 80-82, 86-88, 104, 105, 108, 109 and 132-135 under U.S.C. §103(a) as unpatentable over **Zhang** in view of JP Patent No. 4-152624 to **Satoshi** (Hereinafter "**Satoshi**"), claim 110 as unpatentable over **Zhang** in view of U.S. Patent No. 5,310,410 to **Begin et al.** (Hereinafter "**Begin**"), claims 92-94, 98-100, 14, 115 and 118-120 as unpatentable over **Zhang** in view of U.S. Patent No. 5,310,410 to **Begin**, and claims 82, 85 and 88 as unpatentable over **Zhang**. Please note that in review of the Office Action, Applicant recognized an apparent error in the rejection. In particular, the Examiner appears to reject claims 80-82, 86-88, 104, 105, 108, 109 and 132-135 under U.S.C. §102(e) as clearly anticipated, when in fact, they should be rejected under U.S.C. §103(a). In this regard, the response will address the rejection assuming these claims are rejected under U.S.C. §103(a). Accordingly, this ground of rejection is respectfully traversed for the following reasons and favorable consideration is requested in view thereof.

In formulating a rejection under 35 USC §103, the following four-level factual inquiry must be conducted: (1) determine the scope and content of the prior art; (2) ascertain differences between the claimed invention and the prior art; (3) resolve the level of ordinary skill in the pertinent art; and (4) evaluate objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). In essence, to establish a *prima facie* case of

obviousness, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 USPQ 580 (CCPA 1974).

Applicant respectfully contends that the claimed invention defines subject matter which is clearly patentably distinct over the prior art. More particularly, it is contended that the **Zhang** patent, either alone or in combination with the **Satoshi** and **Begin** patents, fails to expressly teach or implicitly suggest every limitation of the claimed invention necessary to support a *prima facie* case of obviousness under 35 U.S.C. §103(a).

Referring now to the Office Action, in which the Examiner finds that the **Zhang** patent allegedly discloses a multi-chambered apparatus comprising a laser irradiation chamber, a film deposition chamber and a chamber capable of taking the substrate out of the apparatus. The Examiner notes, however, that the **Zhang** patent lacks the necessary disclosure of crystallizing an amorphous silicon film in an oxidizing atmosphere. In an effort to overcome this deficiency, the Examiner finds that, in view of the **Satoshi** patent, it is well known in the art to crystallize amorphous silicon films in an oxidizing atmosphere, the motivation being to enable a polycrystalline silicon film to be grown having large crystals.

Applicant respectfully traverses this finding in contending that there is a lack of suggestion or motivation in the **Zhang** patent to modify its teachings in a manner that would render the claimed invention obvious. In order to render an invention *prima facie* obvious, there must be some teaching, suggestion, or motivation to combine or modify the teachings of the prior art to produce the claimed invention, found either in the references themselves or in the knowledge generally available to a skilled artisan. *In re Fine*, 837 F.2d 1071, 5 USPQ.2d 1596 (Fed. Cir. 1988).

In the present situation, the Examiner finds that the teachings of the **Zhang** patent may be modified to incorporate the feature of crystallizing an amorphous silicon film in an oxidizing atmosphere in spite of no suggestion for making the modification. In fact, the

Zhang patent actually teaches away from what is proposed in the claimed invention *vis-à-vis* crystallizing an amorphous silicon film in an oxidizing atmosphere. It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983).


For instance, the **Zhang** patent discloses from column 2, lines 66 through column 3, line 32 that it is very important to irradiate the laser beam in a vacuum or in an inactive gas atmosphere in order to prevent dangling bonds from bonding with oxygen, etc. Accordingly, the **Zhang** patent recognizes that an oxidizing atmosphere is undesirable during laser irradiation. On the other hand, the claimed invention attempts to obtain non-obvious advantageous results that are derived from crystallizing an amorphous silicon film in an oxidizing atmosphere. Consequently, the teachings of the **Zhang** patent are not amenable to modification since it discloses the undesirability of an oxidizing atmosphere.

Regarding the rejection of claims 92 and 98, these claims are amended so as to be directed to a multi-chamber system including, *inter alia*, a first chamber for irradiating a laser light to a semiconductor film formed over a substrate and a means for introducing an oxidizing atmosphere into the first chamber. Applicant respectfully contends that the **Zhang** and **Begin** patents each fail to expressly teach or inherently disclose a multi-chamber system comprising a means for introducing an oxidizing atmosphere into a first chamber for irradiating a laser light to a semiconductor film formed over a substrate. Thus, the claimed invention cannot be obtained through the proposed combination of the **Zhang** and **Begin** patents.

Accordingly, since the proposed **Zhang** modification fails to teach, disclose or reasonably suggest each and every feature of the claimed invention, Applicant respectfully requests that the §103 rejection of the pending claims be reconsidered and withdrawn in view thereof.

For the reasons expressed above, it is respectfully submitted that the pending claims are in proper condition for allowance. If the Examiner feels that any further discussions would be beneficial in this matter, it is requested that the undersigned be contacted.

Respectfully submitted,



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Marked-up copy of amended claims.

80. (Amended) A multi-chamber system comprising:
a first chamber for irradiating a laser light to a semiconductor film formed over a substrate [under an oxidizing atmosphere];
a means for introducing an oxidizing atmosphere into said first chamber;
a second chamber for depositing a gate insulating film on said semiconductor film;
and
a third chamber capable of taking said substrate out of said multi-chamber system after depositing said gate insulating film.

86. (Amended) A multi-chamber system comprising:
a first chamber for irradiating a laser light to a semiconductor film formed over a substrate [under an oxidizing atmosphere];
a means for introducing an oxidizing atmosphere into said first chamber;
a second chamber for depositing a gate insulating film on said semiconductor film;
a third chamber capable of taking said substrate out of said multi-chamber system after depositing said gate insulating film; and
a means for transporting said substrate among said first, second and third chambers.

92. (Amended) A multi-chamber system comprising:
a first chamber for irradiating a laser light to a semiconductor film formed over a substrate [under an oxidizing atmosphere];
a means for introducing an oxidizing atmosphere into said first chamber;
a second chamber for depositing a gate insulating film; and
a third chamber for putting said substrate in said multi-chamber system and for taking

said substrate out of said multi-chamber system,

wherein said multi-chamber system is capable of depositing said gate insulating film on said semiconductor film irradiated with said laser light.

98. (Amended) A multi-chamber system comprising:

a first chamber for irradiating a laser light to a semiconductor film formed over a substrate [under an oxidizing atmosphere];

a means for introducing an oxidizing atmosphere into said first chamber;

a second chamber for depositing a gate insulating film;

a third chamber for putting said substrate in said multi-chamber system and for taking said substrate out of said multi-chamber system; and

a means for transporting said substrate among said first, second and third chambers,

wherein said multi-chamber system is capable of depositing said gate insulating film on said semiconductor film irradiated with said laser light.